

# Causal Effect of Caffeine on Heart Rate

using latin square design

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## Abstract

After drinking coffee, one's heartbeat raises. This kind of change in metabolism might be responsible for caffeine. To confirm this, we conduct an experiment. Blocked by coffe-to-water ratio and drinking speed, we build  $4 \times 4$  latin square design with caffeine intensity factor. For each cell, we measure heart rate using ECG app installed in Apple Watch (it gives average BPM).

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## References

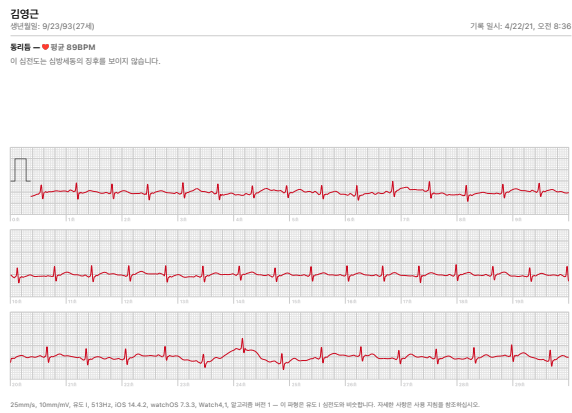
# A Appendix

## A.1 Codes

Package loading:

```
# tidyverse family-----  
library(tidyverse)  
# kable-----  
library(knitr)  
library(kableExtra)  
# set seed for report -----  
set.seed(1)
```

## A.2 ECG Results



(a) (1, 1), House blend (1)



(b) (1, 2), Water (4)

Figure 1: ECG Results